

**DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION**  
**RCRA Corrective Action**  
**Environmental Indicator (EI) RCRIS Code (CA750)**

**Migration of Contaminated Groundwater Under Control**

US EPA RECORDS CENTER REGION 5



Facility Name                      Honeywell Intl Inc  
Facility Address                209 Brewer Road, Danville, IL 61834-0013  
Facility EPA ID No.        ILD005463344  
Prepared by                      Amy Boley                      Date: July 5, 2007

**BACKGROUND**

**Definition of Environmental Indicators (for the RCRA Corrective Action)**

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

**Definition of "Migration of Contaminated Groundwater Under Control" EI**

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and the monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

It must be noted that the "Migration of Contaminated Groundwater Under Control" evaluation is sometimes referred to as a "CA750" determination. "CA750" is the entry item in RCRIS where the results of this evaluation are recorded.

**Relationship of EI to Final Remedies**

While final remedies remain the long-term objective of the RCRA Corrective Action program, the EI are near-term objectives which are currently being used as program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated groundwater and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

**Duration/Applicability of EI Determinations**

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

**Purpose of this Document**

The purpose of this document is to provide a written record of information considered and efforts made to conduct a "Migration of Contaminated Groundwater Under Control" evaluation at the above-referenced facility. This facility is subject to the corrective action provisions of RCRA.

1. Has all available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been considered in this EI determination?

☒ Yes      If yes, check here and continue with #2 below.  
☐ No      If no, re-evaluate existing data, or  
☐ Unknown      If data are not available, skip to #8 and enter "IN" (more information needed) status code.

Rationale and References:

### Overview of RCRA Activities at Honeywell-Danville

All information utilized in this review is available in the Illinois EPA Bureau of Land Files.

### Background

The Honeywell facility in Danville, Illinois formerly produced chlorofluorocarbons (CFCs) and muriatic acid. Operations ceased in September 1994 as a result of governmental regulations mandating cessation of the manufacture of CFCs by the end of 1995. The plant continues to operate as a packaging and bulk distribution facility for CFC replacements.

The facility is a former interim status hazardous waste management facility. A plan to complete closure of its hazardous waste container storage area was approved by the Illinois EPA on April 5, 1985 (Log No. C-63), and certification of closure of the area was accepted by the Illinois EPA on November 25, 1985 (a corrected approval letter was subsequently issued February 13, 1986). The facility has been operating as a hazardous waste generator since this time.

As this facility was once a RCRA interim status facility, it is subject to the corrective action provisions of Section 3008(h) of RCRA. Thus, USEPA conducted an RFA of this facility in 1990.

The facility also had an underground injection well permitted by the Illinois EPA (Log No. UIC-68 and 137). This permit allowed the facility to inject acidic wastewater into the well. The Illinois EPA accepted certification closure of the UIC well on May 11, 2005. The May 11, 2005 letter indicated that corrective action is required for releases from solid waste management units (SWMUs).

An Illinois EPA letter, dated January 12, 2006, was issued to the interim status facility stating that the Illinois EPA and USEPA have a goal that by 2008 this high priority corrective action facility can show that migration of contaminated groundwater is under control (CA750 determination).

The facility is currently taking a site-wide approach (previously focused on SWMU 7 (Main Carbon Tetrachloride Recovery Well Area/General Production Spill Area)), and a comprehensive groundwater monitoring program will likely be established. Based on the Illinois EPA review of the April 17, 2006 document, "Work Plan Environmental Investigation and Site Closure", the facility's proposal to conduct further investigation and groundwater sampling to assess the current status of the

contaminant plumes was approved in the Illinois EPA letter dated July 2, 2007. The facility is actively working to redevelop and survey monitoring wells at the site, install additional investigative monitoring wells, and conduct a Water Well Survey (WWS) in accordance with 35 Ill. Adm. Code, Part 1600. The results from the approved Workplan will be submitted to the Illinois EPA for review and approval.

## **Geology and Hydrogeology**

### Geology

The facility is underlain by localized fill, and glacial deposits of Pleistocene age. In general the composition of the shallow till consists primarily of silty clay to clayey silt (described as moist), underlain by a silty to sandy clay with some gravel and sand lenses (described as moist to wet), underlain by a dense glacial till, which extends to a dolomitic shale.

The silty to sandy clay with some gravel and sand lenses extends to a depth ranging from approximately 12 to 20 feet below ground surface (bgs). The lenses may or may not be continuous.

The glacial till consists of gray silty clay to clayey silt with fairly uniform texture and its density increases with depth. The till extends to a depth of approximately 133 to 163 feet bgs. Discontinuous sand seams averaging one (1) foot thick, occur sporadically throughout the dense till.

### Hydrogeology

The saturated thickness of the shallow aquifer within the alluvial material ranges from five (5) to fifteen (15) feet bgs due to the undulating nature of the dense till surface. The hydraulic conductivity of the shallow aquifer ranges from  $1.06 \times 10^{-5}$  centimeters per second (cm/sec) to  $1.04 \times 10^{-3}$  cm/sec.

The hydraulic conductivity of the dense till ranges from  $6.5 \times 10^{-9}$  cm/sec to  $1.2 \times 10^{-7}$  cm/sec. Based on the low hydraulic conductivity of the dense till, and the accumulation of free phase CCL<sub>4</sub> product at the formation contact, the dense till appears to act as an aquiclude which restricts vertical groundwater flow.

The direction of groundwater flow is generally northwest. Flow direction may be controlled by: (1) the undulating nature of the dense till surface in the western portion of the site; (2) existing underground utilities; and (3) potential groundwater mounding at the largest of three (3) former waste ponds.

2. Is groundwater known or reasonable suspected to be "contaminated" above appropriately protective "levels" (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

"Contamination" and "contaminated" describe media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

- ☒ Yes      If yes, continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.
- ☐ No      If no, skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated."
- ☐ Unknown      If unknown, skip to #8 and enter "IN" status code.

Rationale and References:

The following SWMUs have been identified at the site:

SWMUs 1, 2, 3, and 4: (Inactive Pond 1, Inactive Pond 2, Closed Pond 3, and Inactive Pond 4, respectively) It appears waste was left in place, and potential soil contamination is being investigated at this time. Depending on the results of soil investigations, a groundwater investigation may be necessary;

SWMU 5: (Overhead Injection Line) No further action is necessary;

SWMU 6: (Hazardous Drum Storage Area and Site Drainage Collection Point) Soil investigation is necessary at this time;

SWMU 7: (Main Carbon Tetrachloride Recovery Well Area/General Production Spill Area) SWMU 7 had previously been addressed under the Illinois EPA's Site Remediation Program (SRP). Based on the site-wide approach, groundwater aspects for SWMU 7 will now be reviewed by the RCRA Groundwater Assistance Unit (GAU).

Active groundwater remediation is occurring, and has been on-going since 1987. A groundwater recovery system is in place and a GMZ is established for perchlorate, TCE, and associated breakdown products. The facility pumps and treats the contaminated groundwater on-site. Groundwater pumping related to the product recovery system is operated on a weekly basis, and the primary function is removal of free phase CCL<sub>4</sub>.

Groundwater sampling at the facility has been consistent and the facility has monitored in accordance with their approved Groundwater Monitoring Plan for SWMU 7, which was approved within the April 5, 1993 Illinois EPA letter.

- SWMU 8: (Drainage Ditch Downstream of Deep Well Injection Facility/Drainage Ditch for Facility Before Secondary Containment System Installed) Soil investigation is necessary at this time;
- SWMU 9: (Urethane Foam Disposal Area) The urethane foam cans must to be removed first. Soil will need to be investigated. Groundwater will eventually need to be investigated due to shallow groundwater in this area and waste has been in place for several years; and
- SWMU 10: (Wastewater Pretreatment System) No further action is necessary.

#### Release Information

The primary constituents of concern (COCs) are  $\text{CCL}_4$ , and trichlorofluoromethane (R11), dichlorodifluoromethane (R12), and some VOCs such as 1,1-dichloromethane, methylene chloride, chloroform, trichloroethene and tetrachloroethene.

An April 1979 investigation determined that the presence of free phase  $\text{CCL}_4$  in the subsurface was due to leakage from railroad tank cars, spillage during unloading activities, and/or leakage from the  $\text{CCL}_4$  storage tank because  $\text{CCL}_4$  concentrations decreased radially away from these areas.

The potential sources of detected VOCs were identified as being related to the presence of  $\text{CCL}_4$  and in the subsurface, and from products (or their by-products) formerly manufactured and/or used at the site (i.e. CFC-11, CFC-12, CFC-113, and HCFC-22).

#### Movement of Contaminants in Groundwater

The movement of the dissolved contaminant plume containing R11, R12, and  $\text{CCL}_4$  in the shallow aquifer appears to follow groundwater flow and may be influenced by the storm sewer on the western portion of the facility. These dissolved plumes tend to coalesce into one (1) plume. Dissolved  $\text{CCL}_4$  was also detected at upgradient monitoring wells W-8 and W-24, which may be related to: (1) the presence of contaminant-impacted soil serving as a source at SWMU 3; (2) the occurrence and orientation of sand lenses in the alluvial material; (3) a possible increase in soil porosity due to increased sand and gravel content near these well locations; and/or (4) the pumping of water wells located south and southeast of the site. The free-phase  $\text{CCL}_4$  plume has primarily remained near the central portion of the site over time.

3. Has the migration of contaminated groundwater stabilized (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater" as defined by the monitoring locations designated at the time of this determination)?

"Existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

- ☒ Yes      If yes, continue after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the "existing area of groundwater contamination<sup>2</sup>").
- ☐ No      If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination<sup>2</sup>"), skip to #8 and enter "NO" status code, after providing an explanation.
- ☐ Unknown      If unknown, skip to #8 and enter "IN" status code.

#### Rationale and References:

As noted previously, the facility has an active groundwater recovery system in place and a GMZ is established for perchlorate, TCE, and associated breakdown products of the known release associated with SWMU 7. The facility pumps and treats the contaminated groundwater on-site. Groundwater pumping related to the product recovery system is operated on a weekly basis, and the primary function is removal of free phase CCL<sub>4</sub>.

Dissolved groundwater contaminants have only been detected at wells on-site. There are wells near the western property boundary showing contaminant levels above the 35 Ill. Adm. Code, Part 620, Class I, Groundwater Quality Standards (Class I) (GQSs) for one or more of the primary COCs; R11, R12, and CCL<sub>4</sub>. In accordance with the April 17, 2006 Workplan, approved by the Illinois EPA in a letter dated July 2, 2007, the facility is actively working to implement the plans approved in the workplan, to verify with existing and proposed monitoring wells, that contaminated groundwater is not migrating.

4. Does "contaminated" groundwater discharge into surface water bodies?

- ☐ Yes      If yes, continue after identifying potentially affected surface water bodies.
- ☒ No      If no skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.
- ☐ Unknown      If unknown, skip to #8 and enter "IN" status code.

Rationale and References:

5. Is the discharge of "contaminated" groundwater into surface water likely to be "insignificant" (i.e., the maximum concentration of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g. the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

"Concentrations" as measured in groundwater prior to entry to the groundwater surface water/sediment interaction (e.g., hyporheic) zone.

- \_\_\_\_ Yes      If yes, skip to #7 (and enter a "YE" status code in #8, if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration<sup>3</sup> of key contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.
- \_\_\_\_ No      If no, (the discharge of "contaminated" groundwater into surface water is potentially significant). Continue after documenting: 1) the maximum known or reasonable suspected concentration<sup>3</sup> of each contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations<sup>3</sup> greater than 100 times their appropriate groundwater "levels," the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.
- \_\_\_\_ Unknown      If unknown, enter "IN" status code in #8.

Rationale and References:



6. Can the discharge of "contaminated" groundwater into surface water be shown to be "currently acceptable" (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented)? Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater for pathways near surface water bodies.

The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

\_\_\_\_ Yes      If yes, continue after either

1. identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater OR
2. providing or referencing an interim-assessment appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made.

Factors which should be considered in the interim assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

\_\_\_\_ No      If no, (the discharge of "contaminated" groundwater cannot be shown to be "currently acceptable") skip to #8 and enter "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

\_\_\_\_ Unknown      If unknown, skip to #8 and enter "IN" status code.

Rationale and References:

7. Will groundwater monitoring/measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

  X   Yes      If yes, continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

       No      If no, enter "NO" status code in #8.

       Unknown      If unknown, enter "IN" status code in #8.

#### Rationale and References:

#### Current Activities at the Facility

The existing area of contaminated groundwater is currently defined as the on-site R11, R12, and CCL<sub>4</sub> plumes, which were identified on Figure 4 of the April 17, 2006 Workplan. In accordance with the April 17, 2006 Workplan, the following monitoring wells will be sampled: W-1, W-2, W-5, W-6, W-7, W-8, W-9, W-10/N-7, W-12, W-14, W-15, W-16, W-17, W-18, W-19, W-22, W-23, W-24, W-26, W-27, W-28, W-29, W-31, W-33, W-37, W-38, W-40, W-42, W-43, W-44, N-1, and N-8. In addition, the following wells were approved in the April 17, 2006 Workplan for installation and sampling: three (3) monitoring wells along the western property line in the northern half of the site, three (3) monitoring wells along the storm sewer, and one (1) monitoring well near the southwest portion of the facility. These wells will be analyzed for Volatile Organic Carbons (VOCs) using the USEPA Test Method 8260B. Prior to collecting groundwater samples, water levels would be measured in all monitoring wells.

#### Groundwater Sampling Plan for SWMU 7

Quarterly monitoring has been conducted since the First Quarter 1993, and continues today. The quarterly reports identify the number of gallons of CCL<sub>4</sub> removed (discussed below), and provide analytical results from the sampling event.

Wells analyzed quarterly for VOCs and standard parameters (fluoride, chloride, sulfates, antimony, boron, chemical oxygen demand (COD), total solids, and residue on evaporation include: W-1, W-2, W-6, W-8, W-20, W-23, W-24, W-27, W-28, W-30, N-8, and N-9. These wells were selected based on their location being hydraulically downgradient of areas of known contamination at the site, where low levels or an absence of VOC contamination were anticipated.

Wells analyzed quarterly for total organic carbon (TOC) only include: W-3, W-4N, W-5, W-7, W-9, W-14, W-15, W-16, W-17, W-18, W-19, W-25, W-26, W-29, W-41, and N-1. TOC analysis was chosen for those wells which are closer to the area of known contamination at the site, in an effort to detect large shifts (if any) in the boundaries of the area of known contamination.

8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750)), and obtain supervisor (or appropriate manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

X  YE Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the **Honeywell Intl Inc.** facility, **EPA ID # ILD005463344**, located at **209 Brewer Road, Danville, IL 61834-0013**. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring well be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater." This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

\_\_\_ NO Unacceptable migration of contaminated groundwater is observed or expected.

\_\_\_ IN More information is needed to make a determination.

Completed by: (signature) Amy M Boley  
(print) Amy Boley  
(title) Environmental Protection Geologist

Date: 7/31/07

Supervisor: (signature) Terri Blake Myers  
(print) Terri Blake Myers  
(title) RCRA GAU Manager  
(EPA Region or State) Region 5

Date: 7/31/07

Locations where references may be found:

BOL File, State ID 1838040027; Primarily SRP Technical, also RCRA Permits and Subpart F.

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